

3238-01

What is claimed is:

1. A method for lubricating a two-stroke internal combustion engine containing a power valve, comprising:
 - 5 supplying to the engine a lubricant composition comprising
 - (A) an oil of lubricating viscosity;
 - (B) an additive composition comprising
 - 10 (1) a reaction product of a fatty hydrocarbyl-substituted monocarboxylic acylating agent and a reactive nitrogen-containing compound selected from the group consisting of ammonia, a monoamine, a polyamine, an alkanolamine, a thiol-containing amine, and a mixture thereof wherein the reaction product of the acylating agent and polyamine comprises a heterocyclic reaction product; and
 - (2) a member selected from the group consisting of (a) a hydrocarbyl-substituted aminophenol; (b) a Mannich reaction product of a hydrocarbyl-substituted phenol, an aldehyde, and an amine; (c) a reaction product of a hydrocarbyl-substituted polycarboxylic acylating agent and a polyamine; and (d) a mixture thereof; and
 - 15 (C) a normally liquid solvent having a kinematic viscosity of less than 5 cSt at 100°C wherein the lubricant composition improves the cleanliness of the power valve.
 2. The method of claim 1 wherein the nitrogen-containing compound of the (B)(1) reaction product is a polyamine, an alkanolamine, a thiol-containing amine, or a mixture thereof, and the (B)(1) reaction product comprises a heterocyclic reaction product.
 - 25 3. The method of claim 1 wherein the nitrogen-containing compound of the (B)(1) reaction product is a polyamine.
 - 30 4. The method of claim 1 wherein the amount of additive component (B)(1) in the lubricant composition is at least 1.2% by weight, and the amount of additive

components (B)(1) and (B)(2) combined in the lubricant composition is at least 3.5% by weight.

5 5. The method of claim 1 wherein the oil of lubricating viscosity is a natural oil, a synthetic oil, or a mixture thereof.

6. The method of claim 1 wherein the oil of lubricating viscosity is present in the lubricant composition at 30 to 95% by weight.

10 7. The method of claim 1 wherein the monocarboxylic acylating agent of (B)(1) is a C₄ to C₂₂ fatty carboxylic acid and the polyamine of (B)(1) is an alkylenediamine or a polyalkylenepolyamine.

15 8. The method of claim 7 wherein the fatty carboxylic acid is isostearic acid and the polyamine is a polyethylenepolyamine.

9. The method of claim 1 wherein the hydrocarbyl substituent of the aminophenol of (B)(2)(a) is derived from a polyisobutylene.

20 10. The method of claim 1 wherein the Mannich reaction product (B)(2)(b) is prepared from an alkylphenol derived from a polyisobutylene, formaldehyde, and an amine that is a primary monoamine, a secondary monoamine, or an alkylenediamine.

25 11. The method of claim 1 wherein the hydrocarbyl-substituted polycarboxylic acylating agent of (B)(2)(c) is a polyisobutenylsuccinic anhydride.

12. The method of claim 1 wherein the solvent is a hydrocarbon, an oxygen-containing composition, a mineral oil, an olefin oligomer, or a mixture thereof.

30 13. The method of claim 1 wherein the additive composition (B) further comprises (3) one or more additional additives.

14. The method of claim 13 wherein the additive composition (B) further comprises a friction modifier, an antioxidant, a pour point depressant, or a mixture thereof.

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15. The method of claim 1 wherein the lubricant composition is mixed with a liquid fuel, the mixture of the lubricant composition and the fuel is supplied to the engine, and the weight ratio of the fuel to the lubricant composition in the mixture is 10-250:1.

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16. A lubricant composition suitable for lubricating a two-stroke internal combustion engine, comprising:

(A) an oil of lubricating viscosity;

(B) an additive composition comprising

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(1) a reaction product of a fatty hydrocarbyl-substituted monocarboxylic acylating agent and a polyamine, an alkanolamine, a thiol-containing amine, or a mixture thereof wherein the reaction product comprises a heterocyclic reaction product; and

(2) a hydrocarbyl-substituted aminophenol; and

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(C) a normally liquid solvent having a kinematic viscosity of less than 5 cSt at 100°C wherein the amount of the component (B)(1) is greater than 3.4 % by weight, and the amount of components (B)(1) and (B)(2) combined is greater than 9.6% by weight.

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17. The lubricant composition of claim 16 wherein the (B)(1) reaction product is the reaction product of a C₄ to C₂₂ fatty carboxylic acid and a polyamine.

18. The lubricant composition of claim 16 wherein the additive composition (B) further comprises (3) one or more additional additives.

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19. A fuel composition suitable for fueling a two-stroke internal combustion engine, comprising:

a liquid fuel; and

a lubricating amount of the lubricant composition of claim 16.

20. A method for lubricating a two-stroke internal combustion engine,
5 comprising:
supplying to the engine the lubricant composition of claim 16.